NASA TECH BRIEF

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Materials Data Handbook on Inconel Alloy 718

Inconel Alloy 718 (also known as Inconel 718 and Alloy 718) is a wrought age-hardened nickel-chromium base alloy which was introduced in 1959. This alloy was developed primarily for use at medium-high temperatures up to 1300° F (704° C) to fill a need for a wrought material with good weldability. The sluggish response of the alloy to age hardening permits annealing and welding without spontaneous hardening during heating and cooling. The alloy can be welded readily in the annealed or age-hardened condition.

The alloy exhibits exceptionally high yield, tensile, creep, and creep-rupture strengths at temperatures up to 1300° F (704° C). It also has good properties in the cryogenic temperature range, and its slow-aging response is of great benefit in fabrication processes such as forging and forming.

Typical areas of application for Inconel Alloy 718 are in lightweight welded assemblies in aircraft turbojet engines and for fuel/oxidizer injector plates, forged rings, thrust-chamber jackets, bellows, and tubing for liquid-oxygen-type rocket engines.

A new data handbook has been published, which describes the latest materials-property information on Inconel 718.

This handbook is divided into twelve chapters. The scope of the information presented includes physical- and mechanical-property data at cryogenic, ambient, and elevated temperatures. This is supplemented with useful information in such areas as material procurement, metallurgy of the alloy, corrosion, environmental effects, fabrication, and joining techniques. Design data are presented, as available, and these data are complemented with information on the typical behavior of the alloy.

Information on the alloy is given in tables and figures, supplemented with descriptive text. Source references for the information presented are listed at the end of each chapter. Throughout the text, tables, and figures, common engineering units (with which measurements were made) are accompanied by conversions to International (SI) units, except in the instances where double units would over complicate data presentation or where SI units are impractical (e.g., machine tools and machining). In these instances, conversion factors are noted.

Note:

Requests for this handbook may be directed to:

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